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The Estimation of Remuneration Efficiency in Monopsony: Concerning the Arctic Fishing Industrial Cluster *

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Abstract. At present, new financial mechanisms of interaction between employees and employers in the context of market relations are being formed and improved in Russia. The decisive factor in workers' performance is their financial motivation and stimulation. The determinative of productivity of an enterprise activity is remuneration efficiency as a base of laborers' financial motivation and stimulation. The remuneration is a flexible element of distributive relations and it is impossible to create an effective motivational mechanism without an establishment of its communication with final results. Such indices as salary distribution and salary intensity as basic indicators of wage efficiency assessment have been used in the paper. The object of the research is sixteen large and medium-sized fishing enterprises in the Arkhangelsk region as a part of the Arctic fishing cluster. These enterprises catch fish in the Barents and Norwegian seas, as well as in the North Atlantic. It has been shown that the financial results of fishing enterprises depend on external conditions — primarily on the quotas for fish catch and the price of fish products. In the research, the authors have proceeded from the following hypotheses: the Arctic fishing cluster's enterprises operate in a monopsony on the labor market; there is a pattern between the size of wage fund and financial performance of the Arctic fishery cluster enterprises; the change in wage fund is an effective mechanism to improve the efficiency of the Arctic fishery cluster. In the course of the research, the following interrelated tasks have been solved: the identification of the features of the Arctic fishing cluster's labor market; the assessment of the effectiveness of the wage fund use for the Arctic fishing cluster's enterprises based on the author's methodology; the identification of the importance of the problem of insufficient efficiency of wage fund use in the Arctic fishing cluster.

Keywords: labor market, monopsony, Arctic fishing cluster

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Introduction

Wages and salaries are the most important part of the remuneration and incentive system, influencing performance. The decisive factor in the employees' activities is their wages as an element of financial motivation. The crucial factor in the performance of the enterprise is the effectiveness of wages as the basis for financial motivation and stimulation of employees. Repre-

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senting the main element of distribution relations in any commercial system, wages are quite flexible and easily manageable. Without establishing its interrelation with the final financial results, it is impossible to create an effective motivational mechanism at the enterprise.

The research problem is the following. The Russian fishery, like many other sectors of agriculture, is currently in the process of formation and development. One of the forms of territorial association of enterprises is a production cluster of a certain specialization. The development of not only individual agricultural enterprises, but also the economy of the territorial cluster and the country as a whole depends on how effective wages are in relation to the final result. At the same time, taking into account the peculiarities of the fishing industry cluster functioning, the methodological apparatus for assessing the effectiveness of wages is not well developed.

The aim of the paper is to assess the effectiveness of wages of fish processing enterprises in the Arkhangelsk Oblast, which are included in the Arctic fishing cluster.

In order to achieve the goal it is necessary to solve a number of interrelated tasks:

- to identify the features of the labor market of the Arctic fishing cluster;
- to assess the effectiveness of wage fund use for the enterprises of Arctic fisheries cluster on the basis of the author's methodology;
- to determine the significance of the problem of insufficient wage efficiency in the Arctic fishing cluster.

In our study, we proceeded from the following hypotheses:

- enterprises of the Arctic fishing cluster operate under monopsony conditions in the labor market;
- there is a correlation between the size of wage fund and the financial performance of enterprises in the Arctic fisheries cluster;
- change in the wage fund is an effective mechanism for improving the efficiency of the Arctic fishing cluster.

Literature review

Salary is a complex and multifaceted economic category. Wages determine the standard of living of employees and their families. Ultimately, the pace and scale of the socio-economic development of the state and the social balance of society depend on wages.

Wage is formed at the intersection of production and distribution relations. It reflects interaction of different subjects of economic relations. It is no coincidence that scientific literature constantly discusses issues such as the nature of remuneration, wage efficiency scheme, etc.

For developing a qualitative program of pay scheme improvement, it is very important to define efficiency of existing scheme correctly. What does a payment efficiency scheme mean? From the point of view of some scientists, pay efficiency is a measure of achieving goals [1, Savina S.V., p. 30; 2, Rosefield S., p. 103].

Thus, the results of the “useful” work affect the cost of labor. Provision of enterprises with human resources and efficiency of their use affect the volume of production and sales [3, Stebakova T.A., p. 56; 6, Marinescu I., Ouss I., Pape L.-D., p. 507; 5, Meer J., West J., p. 511].

Researchers agree that wage efficiency evaluation should be based on theoretical developments of the essence of the employer–employee relations. Then efficiency theory can provide a unified explanation for wages and employment trends of some key labor market [6, Schlicht E., p. 2; 7, Goldin C., Katz L. F., p. 150]. At the same time, as S.V. Savin notes, remuneration has national and regional aspects [1, p. 25]. This is confirmed by the work of Megan Millea and Miria Garcia-Vega et al., which examines wage strategies in six industrialized countries with different labor market institutions [8, Millea M., p. 320; 9, Garcia-Vega M., Kneller R., Stiebalet J., p. 3]. Robert Drago, studying the incentives, wages and productivity of employees of Australian companies, notes the trend of decoupling the relationship between wages and economic efficiency [10]. Such a situation is also observed in Russia [11, Dmitrieva S.O., Abubekerova D.P., p. 6; 12, Derkach P.V., Shamrina I.V., p. 478].

The problem of assessing wage efficiency lies in the lack of the possibility of using a single aggregate indicator [13, Borisova V.Yu., Piven I.G., p. 85, 14, Sandrini L., p. 6, 15, Westerman J., p. 176]. This is due to the fact that there are many factors influencing the economic performance, and only one of them is wages. This, in particular, is noted in the works by Sushil Wadhvani and Martin Wall [16, Wadhvani S.B., Wall M.A., p. 530]. Arindrajit Dube, who studied the minimum wage in the long term, proposed his system of performance evaluation [17, Dube A., p. 820]. In terms of assessment methodology, the work of John Addison is of interest [18, Addison J., p. 7]. Christopher Martin and Bingsong Wang offer their methodology for studying the effectiveness of wages in conditions of instability in the labor market [19, Martin Ch., Wang B., p. 7].

Russia has been living in market economy for only 30 years. This is an extremely short period of time. The Russian labor market, like other sectors of the economy, is changing rapidly. In particular, we have written about it in our publications [20, Samarina V.P., Skufina T.P., Samarin A.V., p. 712; 21, Skufina T., Baranov S.V., Samarina V.P., Samarin A.V., p. 3]. Reforming labor incentives is a necessary prerequisite for Russian industry to emerge from the systemic crisis.

Methodology

The effectiveness of the remuneration system is assessed in practice by means of special index indicators. The ratio of the financial results of the enterprise (revenue, net profit) to the payroll can be considered as one of the main methods for assessing the effectiveness of the incentive system. This indicator is called payroll or production cost per one ruble of the wage fund. The second indicator of efficiency is the wage intensity of labor, i.e. the share of wages in the cost of production [6, Schlicht E., p. 6; 13, Borisova V.Yu., Piven I.G., p. 85]. It is obvious that the higher the wage rate and the lower the wage intensity, the more effective the system of remuneration and incentives.

In order to assess the balance between the use of the wage fund and the achievement of financial results, we propose to use the criteria for efficiency indices. Index of revenue, net profit and cost will be evaluated, which represent the growth rates of the corresponding indicators (Table 1).

Table 1

Formulas for calculating index indicators of efficiency of payroll usage¹

Indicators	Formulas
The coefficient of the ratio of the revenue growth index (ΔB) to the payroll growth index ($\Delta\Phi3\Pi$)	$\frac{\Delta B * 100\%}{\Delta\Phi3\Pi}$
The ratio of the net profit growth index ($\Delta\Upsilon\Pi$) to the index of wage growth ($\Delta\Phi3\Pi$)	$\frac{\Delta\Upsilon\Pi * 100\%}{\Delta\Phi3\Pi}$
The coefficient of the ratio of the index of the increase in wages and salaries ($\Delta\Phi3\Pi$) to the index of growth in the cost of sales (ΔC)	$\frac{\Delta\Phi3\Pi * 100\%}{\Delta C}$

Balance criteria:

- positive index coefficient indicates a balance between the use of the wage fund and the achievement of financial results;
- negative index coefficient indicates an imbalance in the use of the wage fund and the achievement of financial results.

The proposed methods for assessing the effectiveness of wages will be tested on the example of sixteen large and medium-sized fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster.

The research was carried out over five-year period in 2015–2019. This time series is not particularly long, but it makes it possible to identify trends in the balance between the indicators of the use of wage fund and financial results.

Results and discussion

Features of the Arctic fishing cluster from the perspective of labor market formation

Fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster, catch fish in the Barents and Norwegian Seas, as well as in the North Atlantic. The volume of production of the main commercial fish species in 2019 amounted to 133 thousand tons. The choice of the object of research is explained by the importance of enterprises for the Arctic fishing cluster and the industry as a whole. Fishing enterprises of the Arkhangelsk Oblast produce 20% of the volume of fish catches in the Northern Basin and 3% of the total volume of fish catches in Russia.

The enterprises under consideration operate in severe climatic conditions associated with fishing in high latitudes [22, Jungsberg L., Copus A., Nilsson K., Weber R., p. 20; 23, Kudryashova E.V., Lipina S.A., Zaikov K.S., Bocharova L.K., p. 449; 24, Samarina V. P., Samarin A. V., Skufina T. P., Baranov S. V., p. 1]. The activities of enterprises are also important due to their high social significance: as long as there is work, the residents of fishing settlements do not leave for other settlements [25, Skufina T., Bazhutova E., Samarina V., Serova N., p. 1030; 26, Larchenko L. V., Gladkiy

¹ Source: authors' developments.

Yu. N., Sukhorukov V. D., p. 2; 27, Samarina V.P., Baranov S.V., Skufyina T.P., p. 208]. Thus, fishing enterprises support the socio-economic development of the region [28, Samarina V. P., Skufina T. P., Baranov S. V., Samarin A. V., p. 7; 29, Jennings S., Leocadio A. M., Metcalfe J. D., p. 901; 30 Topushina E.E., p. 620].

In addition to the enterprises that catch fish in the Barents and Norwegian Seas, as well as in the North Atlantic, there are about 200 small and medium-sized enterprises focused on the development of inland water bodies — the White Sea, rivers and lakes. The Arctic fishing cluster also includes shipbuilding, ship repair and maintenance enterprises, port workers, educational and scientific organizations of the Arkhangelsk, Murmansk, Leningrad oblasts and St. Petersburg. Their indicators were not considered in the analysis of the effectiveness of wages.

Taking all factors into account, a labor market with the following characteristics has formed in the Arctic fishing cluster:

- the enterprises of a regional cluster of the same industry and narrow specialization, closely connected by economic ties, act as employers;
- the labor force is represented by numerous independent wage-earners of approximately the same qualification;
- the enterprises of the cluster are in collusion regarding the wages of workers;
- employees have limited mobility and do not have a real opportunity to change their working environment and employer when selling their labor.

The identified characteristics indicate that the fishing enterprises of the Arkhangelsk Oblast, included in the Arctic fishing cluster, operate under monopsony in the labor market.

Estimation of wage intensity and wage return indicators

Industrial fishing and corresponding processing industry are traditionally developed in the Arkhangelsk Oblast. In recent years, there has been an enlargement of fish farms and enterprises. Strong industrial and financial ties are formed between them.

Let us estimate the indicators of wage intensity and wage return of the fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster, and present them in Table 2.

Table 2

*Wage intensity and wage efficiency of the fishing enterprises in the Arkhangelsk Oblast, which are included into the Arctic fishing cluster*²

Indicators	2015	2016	2017	2018	2019
Wage return on revenue, rub./rub.	24.64	25.08	24.15	24.28	17.08
Wage return on net profit, rub./rub.	0.23	0.24	0.22	0.17	0.18
Wage intensity, %	4.35	4.22	4.20	4.14	6.12

The analysis shows that the wage intensity in terms of net profit is low over the whole period of the survey. This indicates that the enterprises effectively spend the wage fund. Net profit wage-intensity in 2015–2018 is more than a hundred times lower than revenue wage-intensity. At

² Source: authors' calculations.

the same time, the salary return on revenue was quite high in 2015–2018. The payroll ratio in terms of revenue dropped sharply in 2019, while the payroll intensity increased. This is due to the fact that the fishing quota was reduced to 133 thousand tons compared to 150 thousand tons in 2015. Consequently, profit margins decreased as well. At the same time, the wage fund continued to grow. Thus, it is possible to note the instability of indicators.

Official statistical information indicates that wage intensity in Russia is quite high: in 2019, the indicator was 38.9%, having increased by 15% over 20 years [31, Korchak E.A., Serova N.A., Emelyanova E.E., Yakovchuk A.A., p. 4]. This is due to the fact that the increase in wages in Russia in recent years has not been supported by the growth of labor productivity [32, Zaikov K.S., Kondratov N.A., Kudryashova E.V., Lipina S.A., Chistobaev A.I., p. 4; 33, Kryukov V.A., Kryukov Ya.V., p. 32; 34 Shokhin A.N., Akindinova N.V., Astrov V.Yu., Gurvich E.T., Zamulin O.A., Klepach A.N., Mau V.A., Orlova N.V., p. 21].

Against the general background, the fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster, demonstrate good indicators. Salary intensity in 2015–2018 was less than 4.5%. In 2019, wage intensity increased, but remained low.

Estimation of the balance between the wage fund and financial indicators of enterprises of the Arctic fishing cluster

We used index coefficients to identify the balance between the wage fund and financial indicators of the enterprise (Table 3). If the index coefficient is positive, the use of the wage fund and the achievement of financial results are balanced. If the index coefficient is negative, the use of the wage fund and the achievement of financial results are unbalanced.

Table 3

Index indicators of efficiency of wage fund use of fishery enterprises in Arkhangelsk Oblast, which are included in the Arctic fishing cluster³

Indicators	2015-2016	2016-2017	2017-2018	2018-2019
Wage fund growth index (ФЗП), %	1.97	4.78	13.40	16.01
Revenue growth index, %	3.78	0.92	14.00	-18.41
Net profit growth index, %	6.39	-1.29	-12.56	19.54
Cost of sales growth index, %	5.23	5.30	14.93	-21.45
Ratio of the revenue growth index to the wage growth index (КΔВ/ΔФЗП), %	191.92	19.23	104.51	-115.00
Ratio of the net profit growth index to the wage growth index (КΔЧП/ΔФЗП), %	323.95	-26.97	-93.76	122.06
Ratio of the wage growth index to the cost of sales growth index (КΔФЗП/ΔС), %	37.66	90.17	89.76	-74.64

The analysis revealed an unstable situation. The coefficient values indicate that in 2015–2018 the use of wage fund is balanced with revenue and cost of sales (positive coefficient values), but unbalanced with net profit (negative coefficient values). Conversely, in 2018–2019, the use of

³ Source: authors' calculations.

the wage fund is unbalanced with revenue and cost (negative coefficients), but balanced with net profit (positive coefficients).

In general, the study shows that the dynamics of the financial results of the fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster, has little relation to the dynamics of the wage fund. Wage efficiency is low. This conclusion is based on comparison of the financial results of the enterprise and the wage fund using the indicators of wage return and wage intensity.

Significance of the problem of insufficient wage efficiency of fish industry cluster

At the present stage of development of industrial relations in the fishing industry in the Arctic, the problem of insufficient efficiency of wages is actualized by several interrelated aspects. Let us outline some of them.

Firstly, the Arctic fishing industry cannot be considered as successful one. This is due to a number of objective reasons of natural and climatic genesis and subjective reasons related to management, which we will not dwell on in this article.

Secondly, the internal and external institutional conditions of fishery business are constantly changing. There are fewer and fewer levers left for a quick anti-crisis response. The crisis forces entrepreneurs to look for ways to cut costs, primarily by reducing the wage fund.

Thirdly, wages are the main source of income for a working person in Russia. Wages are especially important in a monopsony environment, where the choice of employers is very limited.

Fourthly, the fishing industry in the regions of Russia is increasingly taking on a cluster character. Enterprises, united in clusters, develop a joint economic policy, including payment and incentives for the work of employees.

Fifthly, the financial results of fishing enterprises largely depend on external conditions — on quotas for fishing and current price of fish products. On the other hand, the constant rise in prices for resources, primarily for fuel, reduces the profits of fishing enterprises.

Conclusions

1. The hypothesis that the fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster, operate under monopsony conditions in the labor market, has been confirmed. The situation is characterized by the fact that enterprises of the same industry and narrow specialization, closely related economically, act as employers; the labor force is represented by numerous independent hired workers of approximately the same qualification; cluster enterprises are in collusion regarding the wages of employees; employees have limited mobility and do not have a real opportunity to change their field of activity and employer when selling their labor.
2. The stated hypothesis that there is a pattern between the size of the wage fund and financial results for the fishing enterprises of the Arkhangelsk Oblast, which are included in the Arctic fishing cluster, has not been confirmed. Such a conclusion is based on a

comparison of the financial results of the enterprise and the wage fund with the use of indicators of wage return and wage intensity.

3. The problem of insufficient efficiency of wages is significant due to several interrelated aspects: the Arctic fishing industry cannot be considered to be successfully developing; the internal and external institutional conditions for fishery business are constantly changing; wages are the main source of income for a working person, while the choice of employers is extremely limited; enterprises uniting in clusters develop a joint economic policy, including in relation to payment and stimulation of the work of employees; the financial results of the activities of fishing enterprises largely depend on external conditions.
4. Under these conditions, further development of the Arctic fishing cluster, which, in addition to fishing enterprises, includes shipbuilding enterprises, ship repair and maintenance enterprises, ports, educational and scientific organizations of the Arkhangelsk, Murmansk, Leningrad oblasts and St. Petersburg, seems very promising for reducing costs, increasing profits and wage efficiency.

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